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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,167	02/04/2002	Anthony D. Kurtz	Kulite-69	4919

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EXAMINER

DOROSHENK, ALEXA A

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/067,167

Applicant(s)

KURTZ, ANTHONY D.

Examiner

Alexa A. Doroshenk

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2-4-02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "41" and "45" have both been used to designate the same micropipe in figure 3. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: in figures 4A-4C (none of which are discussed in the detailed description of the specification), numbers 50-55, 53A-55A and 60; in figure 8C number 98; and in figure 9C (which is not discussed in the detailed description of the specification) numbers 101 and 111. Corrected drawing sheets, or amendment to the specification to add the reference character(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be

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labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The use of the trademark Pyrex has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

The disclosure is objected to because of the following informalities: On page 9, lines 15, it appears that "106 and 104" should be "106A and 104A".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-17 contain the trademark/trade name Pyrex. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of

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goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe Pyrex glass and, accordingly, the identification/description is indefinite.

For purposes of examination on the merits, the limitations has been treated simply as "glass".

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3, 5, 6, 12, 13 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Ashmead et al. (5,690,763).

With respect to claim 1, Ashmead et al. discloses a miniature reactor which comprises laminae (wafers) of silicon and glass (col. 6, lines 42-57) and wherein there are a plurality of channels there between (col. 6, lines 10-41) and provided (see figure 7 for an example) with inlet (20V & 24V) and outlet (30V & 34V) openings.

With respect to claims 2 and 3, Ashmead et al. further discloses (in the example of figure 7) channels in a longitudinal direction (264A1, 264A5, 264D1) and channels in a transverse direction (260A-D).

With respect to claims 5 and 6, Ashmead et al. discloses wherein the cross-sectional shape of the channels/pathways can be curved (circular) or trapezoidal (rectangular) (col. 14, lines 38-42):

With respect to claim 12, Ashmead et al. discloses wherein the channels include a metallized area (col. 10, lines 24-26).

With respect to claim 13, Ashmead et al. discloses wherein the channels are from 10-5000 micrometers (col. 2, line 68- col. 3, line 3) in cross-section (.4-197 mils).

With respect to claim 16, Ashmead et al. discloses wherein the silicon wafer is coated with silicon dioxide (col. 6, line 67- col. 7, line 3).

7. Claims 1-5, 7, 10 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Folta (5,644,395).

With respect to claim 1, Folta discloses an apparatus comprising:
a wafer of silicon (23);
a layer of glass (Pyrex) (22) deposited on the silicon wafer (23); and
a plurality of channels (21 and 31) between the silicon (23) and glass (22) with inlets (24 and 25) and an outlet (26).

With respect to claims 2 and 3, Folta further discloses (in the example of figures 3A and 3B) channels in a longitudinal direction (21) and channels in a transverse direction (31).

With respect to claim 4, Folta discloses wherein the structure may combine multiple wafers bonded together (col. 4, lines 53-55), thus forming a portion wherein the glass layer is between two silicon wafers.

With respect to claim 5, it can be seen in figures 3A and 3B that the channels are of a circular cross section.

With respect to claim 7, Folta discloses wherein the glass is deposited in said silicon (col. 4, lines 45-48).

With respect to claim 10, Folta discloses vertical conduits (24, 25 and 26) located in the top silicon layer and enabled to communicate with the channels (col. 4, lines 55-60).

With respect to claim 13, Folta discloses wherein the channels are from 1 – 1000 microns (col. 4, lines 48-49) (.04-39.4 mils).

8. Claims 1, 4, 11, 12 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Grantham et al. (4,467,394).

With respect to claim 1, Grantham et al. discloses an apparatus comprising:
a wafer of silicon (20);
a layer of glass (Pyrex) (14-17) deposited on the silicon wafer (23); and
a plurality of channels (22) between the silicon (20) and glass (14-17) which, though not shown, would inherently have an inlets and an outlet.

With respect to claim 4, Grantham et al. discloses a second wafer of silicon (12) bonded to the glass layer (14-17) to form a middle layer of glass between silicon layers (12 and 20).

With respect to claim 11, Grantham et al. discloses a localized area in the channels capable of producing an electric field (18/24).

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With respect to claims 12 and 17, Grantham et al. discloses wherein the channels include a metallized area (18) of aluminum or gold (col. 4, line 62-col. 5, line 1).

9. Claims 1, 8 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Little (4,392,362).

With respect to claim 1, Little discloses an apparatus comprising:

a wafer of silicon (90);

a layer of glass (95) deposited on the silicon wafer (90); and

a plurality of channels (94) between the silicon (90) and glass (95) with inlet and an outlet (col. 8, lines 13-16).

With respect to claim 8, Little discloses wherein the silicon (90) and glass (95) are bonded by a field assisted bond (col. 8, lines 4-8).

With respect to claim 9, it is held that oxygen ions would inherently form in the glass when field assisted bonding is used.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 4, 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ashmead et al. (5,690,763).

With respect to claim 4, though Ashmead et al. does not specifically state that a second silicon wafer is bonded to the glass wafer to form a middle layer of glass with outer layers of silicon, Ashmead et al. does teach wherein a stack of multiple wafers is contemplated with various chemical reactions wherein the outer laminae are of silicon (col. 6, lines 51-54). One reaction which can occur in an inner layer is photochemical (col. 4, lines 17-46). Ashmead et al. also discloses wherein glass is a suitable material for the wafer of a photoreaction (col. 3, lines 15-18). It would have been obvious to one of ordinary skill in the art at the time the invention was made, using the teachings of Ashmead, to form a structure having a glass inner layer with silicon outer layers in order to generate a micro-photoreactor.

With respect to claim 10, Ashmead et al. further discloses vertical conduits (col. 8, lines 37-39) through the structure.

With respect to claim 16, Ashmead et al. further discloses wherein the silicon wafer is coated with silicon dioxide (col. 6, line 67- col. 7, line 3).

12. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ashmead et al. (5,690,763), as applied to claim 1, and further in view of Robillard et al. (3,984,620).

With respect to both claims, Ashmead et al. discloses wherein the silicon wafers can be of those used in semiconductor electronics (col. 6, lines 34-37).

Robillard et al. teaches wherein silicon wafers for use in semiconductor are preferably intrinsic or doped silicon (col. 5, lines 4-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use intrinsic or

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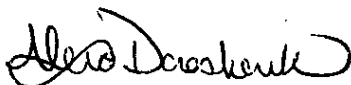
doped silicon for the wafers of Ashmead et al. as it is merely the selection of semiconductor appropriate silicon wafers known to the art and as taught to be preferable by Robillard et al.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexa A. Doroshenk whose telephone number is 571-272-1446. The examiner can normally be reached on Monday - Thursday from 9:00 AM - 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Alexa Doroshenk
Patent Examiner
Art Unit 1764

June 12, 2004